

Cancer is one of the most lethal diseases worldwide. The life expectancy for cancer patients depends on the location of the primary tumour as well as the possible treatments. Colorectal cancer belongs to the three most frequently found types of cancer.

The research described in this thesis aimed to improve anti-cancer therapies with the activation of the immune system, more particularly immune cells called macrophages, by manipulation or activation by using antibodies.

The aim of antibody therapy is to specifically label tumour cells with as result cell death. This cell death can be induced via various mechanisms such as a direct effect by inhibiting growth factors to bind to the cell or indirectly by activating the immune system. One small modification of the antibody - changing the sugar composition - resulted in a significant improved activation of various human immune cells. Moreover, in a mouse model the modified antibody also showed improved protection against metastasis formation compared to the original antibody.

Additionally, it was demonstrated that cetuximab, an antibody that is often used in a therapy for colorectal cancer patients with metastasis, is safe to use prior to surgery of a primary colorectal tumour to prevent metastasis formation.

Finally, two chapters describe how macrophages, immune cells that are often present in high amounts in tumours, can be manipulated by administering or blocking specific molecules, including the by us investigated protein versican, resulting in anti-tumour characteristics and possibly even clearance of the tumour.